



# APRIL '84

## I-M 1 IN A MILLION CLUB

### NATIONAL NEWSLETTER

#### INSIDE...

LOW RES ART CONTEST!  
Q & A FOLLOW UP  
FEATURE SPOTLIGHT  
MORE HELPFUL TIPS  
THREE SHORT PROGRAMS  
FOUR PRODUCT REVIEWS  
MOVING ALONG IN 'THE ARCADE'  
TURNS FROM LOUIS GOOLEY



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Austin, Texas 78750

# GENERAL NEWS

## MORE CLUB PROGRAMS HAVE ARRIVED!

Shortly after the MARCH issue went to print we received several NEW programs for the CLUB LIBRARY. These programs were submitted by HARRY BROWN and LOUIS DOOLEY and will be included in the CLUB LIBRARY ADDENDUM that will appear in a later issue. Thanks to Harry and Louis for sending them in!

## CORRECTION TIME

Although we try very hard to eliminate any errors in the newsletter before the master is sent to the printshop, a few have slipped by.

Aside from a number of TYPOS, the following important corrections should be made:

1. JANUARY-Q & A-Question by WINCE JOHNSON. Line 100 in the BASIC program should have read: 100PRINT1,1NEXT

2. FEBRUARY-HELPFUL HINTS-Routine by CHUCK GLANCY. Line 80 in the SCORING SECTION should have read:

```
80PRINT"SCORE=";"A1;"      SCORE=";"B
```

Some copies were corrected by hand before they were mailed. NOTE: This routine has been reported as troublesome and does not work when used with other HI RES programs. It's purpose was to provide a DISPLAY and as far as we can determine, was not intended to be incorporated in other games without modifications. No mods were provided with the program. If anyone would like to suggest how this routine can be used, we invite you to send in your suggestions.

3. HARRY BROWN also sent along improvements to the ARITHMETIC PRACTICE program that appeared in the FEBRUARY issue. For those of you who would like a hardcopy of these improvements, please write.

## JUDGES NEEDED!!!

This issue contains information about the 1984 IM-1 IN A MILLION LO RES FRONT SCREEN ART CONTEST.

We are in need of THREE JUDGES to evaluate and score each entry. If you would be interested in becoming a judge for this contest and have a working IM-1 with a COLOR TV, we'd sure appreciate hearing from you! Please let us know if you are interested IMMEDIATELY. If there are more than three applicants, names will be drawn.

## NEW MANUAL NOW AVAILABLE!

EDDIE SEDNAR has sent in a copy of his new BASIC LANGUAGE REFERENCE MANUAL that is now available to order.

Much of the information was taken from the original APP version and has been printed on standard 8 1/2 X 11 paper with wide margins for insertion in a binder. The manual contains 16 pages of useful information with topics such as: KEYBOARD, GENERAL INFORMATION, COMMANDS, PROGRAM STATEMENTS, ARITHMETIC FUNCTIONS, STRING FUNCTIONS, MUSIC, LOW RES GRAPHICS, TAPE SYSTEM, SCREEN MAP CHART, SHAPE/COLOR CHART, and POKE INFORMATION.

The manual would be useful to beginner programmers, to those who need a new manual to replace their SHOP WORN original copies, or for those who bought their machines used and never got the original manual with it.

## INFORMATION DRIVE!

One very important function of this newsletter is to provide information to the membership mainly by PASSING ALONG any information that we receive FROM other members.

We should emphasize the word ANY. What one member might find uninteresting, another may find VERY USEFUL. The distinction of what may or may not be useful MUST lie with the individual member. Our job is to keep the data flowing!

## WE CAN'T DO IT WITHOUT YOU!

It would be all too easy to paste up lines after line of BASIC PROGRAMS every month in order to fill the many pages that exist in every issue. This would be intolerable to most members, and is something that we will AVOID at all cost!

Therefore we are asking each of you to HELP THE CLUB OUT by sending in ANY information that you feel would be helpful to other club members. If you doubt that the information can be used, put those doubts aside long enough to get the information IN THE MAIL. We'll ALL appreciate it, especially those members who can really use it, and, wouldn't it be rewarding to KNOW that YOU HELPED!

PLEASE--GIVE IT A TRY!

# Spotlight

"My name is Bill Lunquist. Many of you are using a program I wrote called ROMMON. I also had a part in writing many other programs which are currently being sold for the APF."

"My personal APF IM-1 probably doesn't look alot like yours. I have expanded the computer to 16K memory inside the keyboard. I have built a b/w monitor output board on to the game unit and replaced the socket that holds ROMMON with a ZIF (zero insertion force) socket so that I can easily change and test ROMMON chips. These two changes did not leave enough room for the game's top cover so I also added a larger heat sink to keep the power supply voltage regulator cooler."

"My building block only has one stock APF cartridge. I use the FI-100 disk interface. I have a custom tape board which allows me to read and write Kansas City Standard tapes using any tape recorder. I have another board which uses memory from \$7800-\$7FFF (BASIC expansion) for the software to ram any block of memory from and to the built in tape (my own custom APF tape format). The final board on the building block is a parallel printer driver."

"My personal ROMMON is quite different from the commercial version. It will not work without being connected to the keyboard (The MP-1000 cannot play games by itself). However, my ROMMON will work without the BASIC cartridge. If the BASIC cartridge is in place, the computer will go into BASIC and display only the cursor. If BASIC is not in place, the computer will go into ROMMON's monitor. If a game cartridge is installed, "PLAY!" will be displayed on the screen. If you press "Y", the game will play normally. If you press "N", the computer will go into ROMMON's monitor. I removed "ROCKET PATROL" from my copy to make room for these changes."

"There are many other changes to my ROMMON but I'd like to also tell you a little about what I am doing with the BASIC cartridge. I have modified my BASIC so that I can plug in programmable chips (EPROMS). I started by correcting minor annoyances such as the sound not shutting off after tape save and load, and the disk drive running all of the time. My latest change should be of interest to almost all APF users. I now have software adjustable keyboard de-bounce. Both ROMMON and BASIC use a memory location to determine the amount of de-bounce. If I start getting multiple characters on the screen, I just POKE a higher value to the de-bounce location and everything is fine."

"I have modified the keyboard driver in many ways. If you press the break key, you go to ROMMON's monitor (much easier than "CALL18430"). The keyboard does upper/lower case. Lower case is displayed as reverse alpha. This mod is also supported by ROMMON's editor. Un-shifted characters are upper case and shifted characters are lower case. Since this is backwards, I modified the printer driver so that if a memory location flag is set, the upper/lower case is reversed as it is printed so that it comes out correctly on paper."

"BASIC's maximum line length is normally 128 characters. If you go beyond that number, you lose the whole line. I changed the length to 224 characters. If you try to make the line longer than that, the additional letters are refused but the line is not lost. The EDIT command is no longer in my basic since editing is done by ROMMON. If you list only one line from BASIC, that line is displayed by ROMMON and can be instantly edited by pressing the "E" key."

"I have made far too many changes to cover in this letter. So far, I haven't come up with an easy way to make these improvements available to other APF owners. I can supply the chips quite reasonably, but I cannot (will not) handwire BASIC cartridges to use the chips."

"The changes I have made to my APF have allowed me to modify some great programs to run on the machine. I am using a two pass assembler and line oriented editor which have been used on programs as long as 2,500 lines. If you have any questions about any of the things that I am doing with my APF, please write or call before 9 P.M. EASTERN. Bill Lunquist, 3739 Westworth S.W., Wyoming, MI 49509, (616) 534-6201."

# HELPFUL HINTS

## FROM MARK SPYKESMAN

"I would like to submit a HELPFUL HINT for ASSEMBLY LANGUAGE programmers. The BLOCK MOVE that is outlined in the TECHNICAL REFERENCE MANUAL will move a MAXIMUM of 255 bytes (Not 256 as stated in the manual). It will move an ENTIRE SECTOR (256 bytes) with the following variation:

Set up the destination (A029/A02A) and SOURCE (A02B/A02C) of the BLOCK MOVE--then clear the "B" accumulator and enter the BLOCK MOVE ROUTINE at 7703 instead of 7700. An example in assembly language to move a sector from the disk I/O buffer to AD00 is shown below:

LDX #3A300	ADDRESS OF DISK I/O BUFFER
STX 3A02B	SOURCE FOR BLOCK MOVE
LDX #3AD00	ADDRESS TO MOVE TO
STX 3A029	DESTINATION FOR BLOCK MOVE
CLB	CLEAR ACCUMULATOR B
JSR 77703	MOVE IT

Apparently the people who wrote "ARTIST AND EASEL" were not aware of this because they moved 255 bytes and POKED the 256th byte separately when they were block moving the screens in and out of screen memory. I hope this variation will be as useful to others as it is for me."

---

## FROM HARRY BROWN

"I have a couple of tips on the IM-1, or any other computer for that matter: Plug all cables from the unit into a MULTI-OUTPUT socket, remove during storms, and when not in use. Find the grounded side of the supply plug as well as the receptacle. Mark the plug on grounded side and check when plugging in. This will prevent most static accidents.

If the cassette recorder latch wears and won't retain the lid, repair from exterior by attaching a plastic mirror clip (wrong side up) on the left hand side in front of the lid, just near enough to turn it by hand to open the cassette lid. The left side of the cassette lid tends to ride high and with this simple modification made, the tape will always be in the same alignment."

---

## FROM ERNEST E. SMITH

"In a previous newsletter you requested information on IM-1 parts. I am not sure that my information is still valid, but about a year ago a surplus electronics firm offered IM-1 joysticks. Here is their name and address:

TECHNICAL ELECTRONICS  
232 W. Cummings Park  
Webster, MA 01801  
PHONE (617) 935-1717  
IM-1 MP1000 JOYSTICK STOCK# 38-2497  
PRICE WAS \$8.50 EACH

---

Our thanks to MARK, HARRY, and ERNEST for the tips. If you have any tips that you'd like to pass along to others in the club, please send them in!

# THE ARCADE

In last month's issue we introduced the terms **OP CODE** and **ADDRESSING MODES** along with instruction that covered several methods of loading the A and B accumulator using the various addressing modes. This issue will continue with further methods of using the accumulators. Each new instruction will bring us closer to our goal.  
*Here again...Instruction from ERIC BECKER.*

If you want to load accumulator A with data that is at an address HIGHER than FF, you have to use the next addressing mode which is **LOAD ACCUMULATOR A (EXTENDED)** or as it sometimes appears in print **LDAA EXT.**, or as **HEX B6** according to the actual **OP CODE** called for by the instruction set summary. This command takes 3 FULL BYTES. The first byte B6 is the actual **OP CODE**, and the next two bytes contain the address where the data resides that we want to put into the A accumulator. For example, if we went into the **MONITOR MODE (CALL 2B472)**, and, at any particular address saw the following data:

B6  
02  
50

it would simply mean that when the processor reaches this point, it will immediately load accumulator A with whatever data is at address location 0250 (HEX).

You can load accumulator B extended the same way using the **HEX** value of F6 in place of the B6.

Using the **EXTENDED** mode of addressing gives you the ability to load data from any address between 0000 to FFFF (0 to 64,000 decimal), which is EVERY possible location the processor can address.

So far you have learned to load accumulator A and B using **THREE** addressing modes. There is yet another way! NOTICE THE DIFFERENCE in the following.

**LOAD ACCUMULATOR A INDEXED**, or as it sometimes appears, **LDAA INX**, or **A6** as it is called for by the instruction set summary. This instruction is 2 BYTES long; the first byte being the **OP CODE** for this function, and the second byte called the **OFFSET** byte.

Before we can adequately explain the operation of this command, we must introduce another PART of the processor that

corresponds to this command. It's called the **INDEX REGISTER**.

The **INDEX REGISTER**, or as it commonly appears in print (X), is a 16 bit (2 BYTE) register that is primarily used to store a memory address in the **INDEXED MODE OF MEMORY ADDRESSING**. The **INDEX REGISTER** may be decremented, incremented and stored. The 6800 contains only ONE **INDEX REGISTER**. It is separate from the accumulators and operates differently. We'll learn more about it's operation as we progress, but for the present, our only concern will be how it relates to the **LOAD ACCUMULATOR A INDEXED** command.

The way in which the **LDAA INDEXED** command works is that the A accumulator will be loaded with data that is located at an address that is IN the **INDEX REGISTER**, PLUS the offset byte (Second byte in the command as mentioned earlier).

For example, in this mode of addressing, the **NUMBER (Offset)** found in the 2nd byte of the instruction is ADDED to the contents of the **INDEX REGISTER** to form a new and different **EFFECTIVE ADDRESS**. The new effective address is the location in memory which contains data for the operation or is the **DESTINATION** for data.

This new effective address is held in a temporary address register such as **AC-CUMULATOR A** so the contents of the **INDEX** register is not destroyed or altered. Let's assume that the index register contains an address of 0520 (HEX). By using the **LDAA INX** command, the processor will load accumulator A with the number 0520 plus the offset byte.

Another way of this explaining this is, if the processor comes across an address that contains the **OP CODE** of A6 (**LDAA INX**), it would know that it is going to ADD the next hex value it comes across to 0520 and put this new value into A ACCUMULATOR, so if immediately following our value of 0520 the **HEX** value of 20 appeared (**OFFSET BYTE**), it would ADD this value to the index register value and place the results in A accumulator thus producing our **NEW EFFECTIVE ADDRESS** of 0540.

The **OFFSET BYTE** can be any number between 00 and FF.

**NEXT MONTH--STORING THE CONTENTS OF THE A ACCUMULATOR TO THE SCREEN! SEE YOU THEN!**

# SHORT PROGRAMS

These short programs were taken from the club PROGRAM LIBRARY. The program on the left side of the page to be used for SORTING names alphabetically. The program, top right, displays the conversion from HEXIDECIMAL to DECIMAL. Very useful when involved in machine language programming. The program, bottom right displays the conversion from gallons to liters and vice versa. Please write and let us know what TYPES of programs YOU are interested in seeing in the newsletter. If there are a few in the PROGRAM LIBRARY that you would like to see printed, let us know which ones they are so that we can reserve space for them in future issues.

```

1  PONE 24570:30
2  DIN RN(1)
3  DIN NULL(20)
4  FOR I=0 TO 20:NULL(I)=""
5  CALL 17946: PONE 4096:1,9
50 DIN RN(20)
11 DIN RN(20)
12 FOR I=0 TO 20:RN(I)=NULL
20 CALL 17946
21 RN=""
30 PONE 4096:1,9
40 L=0
45 PRINT : PRINT : PRINT
50 PRINT : PRINT : PRINT "S O R T   R U N N I N G"
65 PRINT : PRINT "ENTER NAMES---999 TO QUIT"
70 B=0
80 INPUT RN(0:20)
90 B=B+1
92 C=B-1
95 IF RN(C:20)=999 THEN B=B-1: GOTO 200
100 GOTO 80
200 CALL 17946: PONE 4096:2: PRINT : PRINT : PRINT "WAIT PLEASE"
210 FOR I=0 TO B-1
230 FOR K=I+1 TO B
220 IF RN(I:20)>RN(K:20) THEN RN=RN(I:20):RN(I:20)=RN(K:20):RN(K:20)=RN
230 NEXT K
240 NEXT I
250 FOR I=1 TO B
260 PRINT RN(I:20)
265 IF I=14 THEN INPUT "TYPE (RTN)">RN
270 NEXT I
280 INPUT "TYPE (RTN) TO QUIT">RN
285 IF RN="" THEN 290
292 RN=RN+""&RN(1):""&1: GOTO 5
290 PRINT : PRINT "SORT COMPLETED": PRINT : PRINT "

```

```

2  PONE 24570:30: DIN RN(1): GOTO 10
3  CALL 17946: PONE 4096:2: PONE 4096:4: RETURN
10  GOSUB 3: PRINT "HEX  T O  DEC"
12  BASE=16#
14  PRINT "ENTER HEX "
15  IF KEY$ (0)="" THEN 15
20  RN(1)= KEY$ (0)
22  PRINT RN(1)
25  B=400 (RN(1))
30  IF B>47 THEN IF B<50 THEN B=B-40: GOTO 100
35  IF B=44 THEN IF B<70 THEN B=B-35: GOTO 100
100 T=T+(B#BASE)
105 BASE=BASE/16
110 IF BASE<1 THEN BASE=4096: GOTO 150
115 GOTO 15
150 PRINT " "
151 PRINT "DEC = "T
157 PRINT : PRINT "PRESS RTN"
158 IF KEY$ (0)="" THEN 150
159 IF KEY$ (0)=C="" THEN 159
160 GOSUB 3
162 T=T+0
165 GOTO 14

```

```

5  REM   BASE BY MANUEL HANEZ 81040
6  REM   APRIL 21 1981
7  CALL 17946
9  PRINT : PRINT : PRINT
10 PRINT "THIS PROGRAM CHANGE GALLONS TO LITER"
11 PRINT "OR LITER TO GALLONS"
12 INPUT "1=LITER-2=GALLONS">C
13 IF C=1 GOTO 40
14 IF C=2 GOTO 20
20 INPUT "HOW MANY GALLONS">R
25 PRINT "THE CONVERSION IS = 10"
30 PRINT USING "###.##";R/3.0
35 GOTO 50
40 INPUT "HOW MANY LITER">D
43 PRINT "THE CONVERSION IS = 10"
45 PRINT USING "###.##";D/3.0
47 GOTO 50
50 INPUT "W CONTINUE - 1 END">E
52 IF E=0 GOTO 7
54 IF E=1 GOTO 40
48 PRINT : PRINT "      GOSUB-RTE"
70 END

```

# Q & A

## FROM THE JANUARY ISSUE

**QUESTION:** By VINCE JOHNSON concerning the use of a comma when producing columns, and how to reset it so that the columns will not appear to be ragged when trying to make 9 or more columns. (An error appeared on LINE 100 in the January issue. The statement should have read:

100PRINT1,;NEXT

**ANSWER:** Submitted by W.B. LUNQUIST, Wyoming Michigan.

"Here is my solution to the problem with using the comma to print long lists of information. After each PRINT statement, POKE41033,0. This resets the APF counter so that it never gets high enough to cause the carriage return and line feed which looks so bad."

"The APF assembly code is:"

```

LDAB FLDCHT This is the counter.
FIELD2 LDAA #32 Load the A reg. with
an ASCII space.
JSR OUTCH Print it.
INCB INCB Add one to the counter
BITS #7 See if we are at
an even tab location.
BNE FIELD2 If not, do another apc
CMPB #71 This is the problem.
This probably should
be 63.
BNI FIELD3 If 3 is greater than
71, then do carriage
return.
STAB FLDCHT Save counter
BRA PRINT1 Skip past the carriage
return.
FIELD3 JSR PCKLF Print carriage return
and line feed.
PRINT1 INC----- etc. CONTINUE PRINTING

```

"I have changed the 71 value to 63 on my BASIC cartridge so I don't have the problem any more. I hope this clears up this particular problem."

## FROM THE FEBRUARY ISSUE

**QUESTION:** By DAVE CONWAY & JOHN PIERCE concerning the requirements to change the SI-232 output characteristics so that it can operate fixed printers such as the GORILLA BANANA or RADIO SHACK TP-10.

**ANSWER:** Submitted by MARK SPYKEMAN, Sealand Michigan.

"The BASIC cartridge sets the SI-232 to 7 DATA bits, EVEN PARITY, 2 STOP bits.

# FOLLOW UP

The ACIA can be programmed for other characteristics (as shown in the lower right corner of page 9 in the SI-232 manual) by POKING the proper value into the ACIA CONTROL REGISTER. The ACIA CONTROL REGISTER address is \$6400 HEX, or, 25600 DECIMAL. The table below shows the DECIMAL values to be poked into the CONTROL REGISTER for the various available output characteristics:

# OF DATA BITS	PARITY	# OF STOP BITS	DEC. # TO POKE
7	EVEN	2	1
7	ODD	2	5
7	EVEN	1	9
7	ODD	1	13
8	NONE	2	17
8	NONE	1	21
8	EVEN	1	25
8	ODD	1	29

10 POKE 25600,3: POKE 25600,17

The BASIC line above will issue a MASTER RESET to the ACIA and then set it up for 8 DATA BITS, NO PARITY, and 2 STOP BITS. The assembly language routine for the same set up as the BASIC line above would be:

```

86 03 LDAA #3 RESET
87 6400 STAA $6400
86 11 LDAA #11 HEX FOR DBC 17
87 6400 STAA $6400 SET UP 8 BITS, NO PARITY
39 RTS RETURN

```

I have set my OKIDATA printer up for 8 DATA bits with EVEN PARITY, and have been able to print on it using the methods shown above. This method seems to work fine for printing under PROGRAM CONTROL, however, there is still a problem in getting program LISTINGS. This problem exists because every time the computer returns to the IMMEDIATE MODE (Cursor on the screen waiting for the user to type in a command or a BASIC line) the BASIC cartridge RESETS the ACIA to the ORIGINAL SETUP OF 7 DATA bits, EVEN PARITY, and 2 STOP bits. This means that if you type "POKE25600,17" in the IMMEDIATE MODE to change the output characteristics as mentioned above, the computer will change them right back again before the cursor comes back on the screen, making it impossible to get a PROGRAM



# Q & A

# FOLLOW UP

LISTING in the IMMEDIATE MODE.

There are 2 ways to get around this problem though. One way is to include a BASIC line in your program that will allow you to LIST OUT A PROGRAM. The line shown below will accomplish this:

```
9990PRINT=1:POKE25600,3:POKE25600,N:LIST
```

Where N is the DECIMAL NUMBER to POKE from the table. Make sure you have an "END" or "STOP" statement in your program prior to this line or you will be getting a LISTING every time you RUN the program. To get a program listing just type in COTO9990. After the cursor comes back on the screen type PRINT=0 to turn off the printer flag. (PRINT=0 cannot be included at the end of line 9990 because after a LIST command, the computer always goes to the IMMEDIATE MODE and will not execute it.)

It is not always possible to add a line to a BASIC program such as the example on the other page, without some major difficulty. For example, there may be some data that is protected by an offset END-OF-PROGRAM pointer. Adding a line to the program would probably cause you to lose that precious data. BE NOT DISCOURAGED! There is another way to get your program listed. First, type in the following short program:

```
10FOKE=0T017
20READY
30POKEK,Y
40NEXTY
50DATA134,1,183,161,203,134,3,183,100,0,134
60DATA17
70DATA183,100,0,126,140,180
```

This program installs a MACHINE LANGUAGE ROUTINE at memory address 0000 that will allow you to get a listing on your printer. Just RUN this program, then load in the program you wish to LIST to the printer. Next type in CALLB. The printer should list the program. After the cursor comes back on the screen, type PRINT=0 and you will have accomplished your mission! The program shown above is for 8 DATA bits, NO PARITY. To set up for other output characteristics all you have to do is change line 60 in the program. The DATA in line 60 should be set to the DECIMAL NUMBER to POKE into the CONTROL REGISTER (Found in the table). This program can be saved on disk or tape and can be loaded

and run prior to loading the program you wish to LIST on your printer. This program will stay in memory unless you run a program that uses memory addresses 0000-0011. For this reason it is best to get your listing out (TYPE "CALLB") before you RUN the program."

---

PETER MORANSKI sent in his solution to the preceding question. He writes, "I currently have a GORILLA BANANA CK-100 printer hooked up to my APF. To fix the software they must POKE location 25600,03 which in turn resets the ACIA. Next they must POKE 25600,17 which sets the clock and data format.

The only problem is that you can't use it in the IMMEDIATE MODE. As an example, you cannot reset the ACIA and then try to list a program. You must write up a very short program beforehand to allow you to do this. The program is as follows:

```
1POKE25600,03:POKE25600,17
2PRINT=1:LIST
```

Enter your program from here on.

This will LIST your program to the printer provided it is a part of the program. If you have ROMMON, you can set up the ACIA from the MONITOR, and then use the printer option and it will work fine.

The only thing that I can figure out is that the BASIC interpreter resets the ACIA every time it outputs to the printer in the IMMEDIATE MODE. If anyone would have further questions and would like to contact me, they can call 914-896-8586 between 9 AM and 1 PM E.S.T., TUESDAY THRU SATURDAY, or all day on SUNDAY AND MONDAY. Or they can write to me at:"

35 REVERE ROAD  
FISHKILL, NY 12524

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A SPECIAL THANKS to BILL LOWDUST, MARK SPYKERMAN, and PETER MORANSKI for detailed instructions and examples.

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# PRODUCT REVIEW

## BOOK KEEPER

If you're looking for a good bookkeeping program for your IM-1 that is easy to use, JIM CLATFELTER'S BOOK KEEPER program may be just what you need.

This program allows you to do simple bookkeeping chores for home or business. You can create individual accounts, develop 4 income and 10 expense accounts, and make up to 120 entries per month.

The program is menu-driven and allows for QUICK DATA ENTRY and correction. Your data can easily be saved to either tape or disk, and the program is set up to print the data to an 80 column printer.

For home accounting, the program keeps a record of actual income and expenditures with detailed data for each entry. This makes it more versatile for home budgeting than other budget programs that accept only minimal information about an entry.

For checking and savings accounts simply enter deposits in an INCOME ACCOUNT and checks, bank service charges, and automatic payments in EXPENSE ACCOUNTS. There are endless variations that you can come up with.

I have found this program to be well documented, easy to use, and flexible enough to be used in practically any personal or small business accounting situation.

## SUPER BASASM

Have you ever experienced the LET DOWN of needing to add a line to your BASIC program after finding that you failed to leave room for additions or expansion? SUPER BASASM from HEDWART provides you with means to re-number your ENTIRE program, or any portion of it, with user defined increments between BASIC line numbers, and starting points.

By itself, the BASIC re-numbering portion of this program would serve to adequately re-number most any BASIC program that exists, however, HEDWART did not stop there! For instance, the referenced line pointers are AUTOMATICALLY UPDATED and will accommodate reference calls such as GOTO, GOSUB, ONGOTO, ONGOSUB, IFTHEN (when line # is specified), and PRINT USING (when line # mask is used).

The program does not occupy any user RAM whatsoever and can be used to re-number programs in an 8K IM-1, an expanded 16K IM-1, or a 27K IM-2. Assembly (MACHINE) language subroutines written under a "REM" statement are unaffected by this program.

SUPER BASASM includes 4 ERROR SEEKING CHECKS; 1. If you exceed BASIC line number 9999 when the program is re-numbered, 2. If your starting line (user defined) does not exist, 3. If the re-numbering causes the program to exceed the memory of your system, 4. If the offset pointer would cause SUPER BASASM to go off into an endless loop. If any of these errors occur, an appropriate ERROR MESSAGE is produced. The program is USER FRIENDLY with easy to understand PROMPTS, error checking and mistake recovery features and comes with easy to follow instructions.

## DC-232

With necessity being the mother of invention, and with the scarcity of BUILDING BLOCKS and INTERFACE CARTRIDGES for our computers, INVENTION has become somewhat of a NECESSITY for our IMAGINATION MACHINES! Glenn Jones has developed a very useful SERIAL CARTRIDGE (DC-232) that not only serves as an interface to either PRINTER or MODEM, but also eliminates the requirement for a BUILDING BLOCK (DB-1) to operate these serial devices.

In actuality, the unit is a STANDARD AIT SI-232 CARTRIDGE that has been modified with DB-1 circuitry inside, and contains a ribbon cable and connector that plugs into the edge connector reserved for the DB-1 (in the rear of the computer).

For those of you who have been looking for a DB-1 but have not been able to find one, this unit could possibly be the answer to your serial interfacing need. If you would be fortunate enough to obtain a DB-1 at a later date, the DC-232 can then be DE-MODIFIED back to its original state (SI-232) and plugged into one of the slots in the DB-1. This feature eliminates the need to purchase an additional SI-232 at a later date.

We've had the opportunity to check the unit out and have connected it to our ADOS terminal, SINGMAN MARK VII MODEM, VOLKSMODEM, and our ancient SANGARD T-103A. The DC-232 worked well with these devices, with no errors in upper or lower case both to and from the devices, and when running different types of software with it. This unit is a very welcomed addition to the IM-1 interface line.

## AIT-DMPIA

The AIT-DMPIA PARALLEL PORT CARD plugs directly into the DB-1 expansion. It's sixteen parallel bidirectional data lines and four control lines come off the board through a 50 pin edge connector and three feet of flat fifty ribbon cable which is included with the card.

The assembly of the card is a MOTOROLA M6821 PERIPHERAL INTERFACE ADAPTER. The 16 parallel lines which are in two groups of eight (A-side/B-side port) are BIT PROGRAMMABLE as INPUTS OR OUTPUTS. The 8 lines on the A-side are pulled up and can drive 1 standard TTL load each, or can accept an input from a standard TTL device. The 8 lines on the B-side are buffered and can easily drive 10 TTL loads. The 4 control lines, also programmable, are used for handshaking with external devices. Half the control lines act as INPUT ONLY whereas the other 2 are BI-DIRECTIONAL. The parallel port is DIRECT MEMORY ACCESSIBLE and can be programmed from BASIC with POKEs or examined with PEKs. The card can be used to control everything from the simple LED's and switches on A.I.T.'s TRAINER BOARD (AIT-DMPIA-S1), which will be reviewed next month, to the fine tuning of your household heating system. A useful addition for IM-1 EXTERNAL CONTROL.



# Artshop

## ANNOUNCING THE 1984 LO RES FRONT SCREEN COMPUTER ART CONTEST!

The contest begins NOW! All entries received must be POSTMARKED NO LATER THAN JUNE 10, 1984. Rules: One entry per member. Entry must be submitted ON TAPE and consist of ONE FRONT SCREEN done in LOW RESOLUTION GRAPHICS with ALPHA/NUMERIC CHARACTERS if desired. Any LO RES shape and any COLOR OR CHARACTER can be used. The picture must appear on screen locations 512 to 1023 (FRONT SCREEN). NO MOVING CHARACTER will be considered in the judging process. ONLY THE FRONT SCREEN WILL BE JUDGED. NO COMMERCIALLY PRODUCED FRONT SCREENS WILL BE ALLOWED.

Judging: Each entry will be judged by a THREE MEMBER panel selected by a drawing of all judge applicants (as explained in the GENERAL NEWS). The following point system will be used:

DETAIL AND COMPLEXITY OF THE ARTWORK (1 to 20 points)  
COLOR COORDINATION AS IT PERTAINS TO THE OVERALL PICTURE (1 to 15 points)  
JUDGES' PREFERENCE (1 to 10 points)

At the conclusion of the contest period, copies of ALL entries will be placed on a single tape and sent to each judge. A scoring sheet will accompany each tape. After the judges have scored each entry, the scores will be returned to us for the final point tally, at which time the GRAND PRIZE WINNER will be determined. Decisions of the judges will be final, and in case of a tie the GRAND PRIZE WINNER will be determined by a drawing. The winner will be notified by telephone at the end of the point tally, or drawing, whichever the case may be.

The decoded WINNING ARTWORK will appear in a future newsletter. This will allow ALL MEMBERS to enter and see the GRAND PRIZE WINNING FRONT SCREEN.

This computer art contest is sponsored by the following producers of software for the IMAGINATION MACHINE. Each has submitted a program to be awarded to the GRAND PRIZE WINNER.

NEEDMART SOFTWARE-YOUR CHOICE OF PROGRAM  
GLENN JONES-GAME 'PERSON'  
JIM CLATFELTER-COMBINATION-BOOK KEEPER/RAWT KEEPER  
ERIC BECKETT-GAME PROGRAM  
JUDIS BERNAR-GAME-'STAR CASTLE'

GRAND PRIZE: In addition to the programs listed above, the winner of the 1984 LO RES FRONT SCREEN COMPUTER ART CONTEST will receive:

A BEAUTIFUL WALL PLAQUE CONMEMORATING THE CONTEST AND DEPICTING THE WINNER.  
ALL PROGRAMS PRODUCED BY GEO\*GRAPHIX LIMITED.  
CHOICE OF 10 PROGRAMS FROM THE CLOS PROGRAM LIBRARY.

This contest is legal in states that permit their residents to engage in contest activity outside their state boundaries....VOID WHERE PROHIBITED. Note: If you would like your tape returned, please enclose 37¢ postage (stamp) to cover the return postage. Also, be sure to give your front screen a title. Send all entries to:

ART CONTEST  
c/o GEO\*GRAPHIX LIMITED  
P.O. BOX 54  
ARROWSMITH, IL 61722

REMEMBER THE DEADLINE AND.....GOOD LUCK!!!

Greg M. Ching  
121 Emerson St.  
Palo Alto, CA 94301

A senior, double majoring in Electrical Engineering (Computers), and Philosophy (Formal Systems) at Stanford University.

"I am very interested in working to extend the capabilities of my IM-1, especially in the area of MAIN FRAME communications."

R. Bruce Hoekien  
70 Darwin Ave.  
Marriott Island, FL 32953 (305) 452-3015

Space Shuttle Systems Engineer/Programmer at Kennedy Space Center, Florida, President of Space Coast Microcomputer Club and Computers-for-Kids (COK) project in local school system. Now writing APP IM-1 educational software for school labs with more than 50 APPs in daily use.

## THE NATIONAL MAILBOX

Steven G. Liberatore  
7 Richard Circle  
Woburn, MA 01801

"I own an IM-1 with dual disk drive, RS232 interface, printer, and a modem. I am an Electrical Engineer at U-MASS and hope to use my machine for more uses other than playing and programming games."

John Pierce  
1731 N. 1575W, #8  
Layton, UT 84041

"Please put my name in the 'LOVELY COMPUTER' section. I'm an electronics technician with the U.S. AIR FORCE."

Michael Russell  
Box 2084 CS  
Pullman, WA 99163

"Havecessive software for the APP. Have expended the machine to control my outside electrical device. Will help or trade with interested APP owners."

Andrew B. Meul  
2558 Everglade Dr.  
Lake Havasu City, AZ 86405 (602) 895-8963

"I know how to program in BASIC very well. I plan to go to one of the Arizona universities next year. Major: Chem Engineering. I would like to know how to program in other languages."

Delight E. Morris  
2324 Blaini Dr.  
M. Palm Beach, FL 33406

"APP computer, RS232, RS-45, Epson Printer, Modem. Interested in flying, ham radio, machine programming, real estate, gardening, beer!"

Douglas L. Smith  
3652 Persimmon Dr., Apt. T2  
Fairfax, VA 22031

"Have system with 2 disk drives and a printer & modem. Am interested in finding adventure for the IM-1. Am professional computer programmer. Like to trade programs and write programs."

# THE LANGUAGE BARRIER

## READ

Using this statement allows you to actually READ the DATA that is stored within your program in DATA statements. These two commands work hand and hand. The variable list (DATA STATEMENT) denotes which variables are to have values assigned. Variable NAMES in the list are separated by COMMAS. The variable list may include NUMERIC VARIABLES and/or STRING VARIABLES as mentioned in a previous issue of the newsletter.

The computer will read each DATA statement sequentially from left to right and will assign values to the variables in the variable list from left to right. DATA statements are normally read in LINE NUMBER ORDER. Wherever a READ statement is performed in your BASIC program, values for the variables in the variable list are assigned sequentially, using all the items that were in the DATA list of the current DATA statement before going on to the next DATA statement. There is a way to OVERRIDE this sequence using the RESTORE statement.

When RESTORE is used values will be assigned beginning with the FIRST DATA statement in the program. In effect it is resetting the data pointer back to the original starting point.

The following is a short program using the DATA and READ statement without using the RESTORE statement:

```
10FOR=1TO3
20READX
30PRINTX,
40NEXTX
50DATA10,20,30
```

Line 10 sets up the X loop for 3 cycles.  
Line 20 will read the first value from the DATA statement and put this numeric value into the X variable.  
Line 30 prints this number in a column.

# CLASSIFIED

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Washington, D.C. 20545

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JIM CLATFELTER  
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Glendale, CA 91206

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Line 40 sends the program back to the preceding READ statement until the FOR NEXT statement has been completed; 3 loops. We end up with three columns containing 10, 20, and 30.  
Now, insert 25RESTORE. Run the program again and you will find that 3 columns of the same number (10) have been printed, hence the RESTORE statement resets the pointer during each loop.

\* \* \* HARDWARE \* \* \*

**DC-232 SERIAL INTERFACE**

NO BUILDING BLOCK REQUIRED! Allows the connection of a printer, modem, or other serial device to your IM-1. Includes a FREE copy of the LINE PROCESSING SYSTEM, an upper case, pseudo word processing program.....\$44.95  
DC-232 & RS-232 cable.....\$59.95

**SI-232 SERIAL INTERFACE**

New, with APF manual.....\$14.95  
SI-232 & RS-232 cable.....\$29.95

**RS-232 CABLE**

Please include pin connections for your printer, or specify standard cable.....\$19.95

ALL ORDERS WHICH INCLUDE ONE OR MORE OF THE ABOVE ITEMS  
MUST INCLUDE \$5.00 FOR SHIPPING AND HANDLING.

**16K INTERNAL MEMORY KIT**

This perfect complement to the DC-232 eliminates the need for the RS-K RAM by expanding your computer's memory to 16K internally. Comes complete with parts and instructions....\$24.95

**24K MEMORY INSTRUCTIONS**

Requires BUILDING BLOCK & RS-K RAM; comes with detailed instructions, illustrations, & schematics only.....\$14.95

\* \* \* SOFTWARE \* \* \*

**FERZERX**

Absolutely one of the best, most professional arcade games available for the IM-1! 100% machine language means the action DOES NOT STOP for sound effects, as in most other games. Similar to Atari's BERZERK arcade game (8K).....\$9.95

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**SPECIAL** Introductory offer from **A.I.T.**, the Advanced Interfacing Team.

**..FLASH .....** GREAT NEWS FOR THE IM-1 OWNERS.....**NOW AVAILABLE.....**  
**.. A PARALLEL PORT FOR YOUR IM-1....**A true extension into the world of interfacing...

AIT, the Advanced Interfacing Team, has just developed exclusively for the IM-1, the AIT-IMPIA parallel port card. Once the AIT-IMPIA is plugged into the IM-1 it's interfacing capabilities are limited only by your "IMAGINATION". Imagine sixteen parallel data lines and four control lines, from the power of Motorola's M6821 peripheral interface adapter, out to the end of a ribbon cable, and controlled by the Imagination Machine. With some imagination and a little skill it will be no time at all before you are turning lights on and off, monitoring room temperatures, running your model railroad, doing A/D and D/A conversions of all types. Whatever you might imagine, all under the software control of the IM-1, a powerful Motorola M6800 based microcomputer. **ORDER YOURS NOW.**

If you have reservations about your hardware skills in interfacing with a parallel port, AIT has thought of you too. With the addition of our AIT-IMPIA-SI experimenters attachment, you will in a short time learn the basic interfacing skills and technical finesse. The AIT-IMPIA-SI is a simple trainer board designed to help you learn how to use the AIT-IMPIA parallel port card. Lessons are included in the purchase price of the AIT-IMPIA-SI. Don't delay **ORDER NOW.**

\*Special Introductory prices are good until April 30, 1984. Allow four to six weeks for delivery.

(tear off here)

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Money Order Payable to:  
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Mail order to: Advanced Interfacing Team  
2039 Margaret St.  
Philadelphia, PA. 19134

In the interest of helping the IM-1 owners with their hardware needs we are asking that you might take the time to respond to our questionnaire. This survey in no way obligates you to any purchases. It is strictly for our records and consideration for future items.

Are you interested in the following support Hardware?

Yes NO

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